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deducting so much per cent. for the loading on said premium, thus allowing only 4 per cent. to the Company, must be considered as too high a price if the above reasons are right, and at best but a very slovenly way of arriving at the value of surrendered policies, when we come to consider amongst other things that the loading is not usually equal at every age.

The rate charged in paying for a policy, adopted by the London actuaries, is 5 per cent.—a rate we may consider about equal, comparatively, to the maximum rate.

The Carlisle mortality being moderate, from experience it may be considered as a safe rate, in conjunction with 6 per cent. compound interest, for valuing policies for surrender. A sample table of values calculated at those rates we give as under, for the benefit of our readers and as affording an interesting view of the value at different ages from twenty to fifty, and a policy from one to forty years old.

The following examples will exhibit a few of the values taken from the Table of the Value of Life Policies, Carlisle 6 per cent., showing the value per cent. of policies of different ages of entry at the end of any number of years:—

Age at Entry.	Value in 1 year.	5 years.	10 years.	20 years.	30 years.	40 years.
	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.	Dollars.
20	0·44	2·55	5·49	12·36	21·60	37·28
30	0·55	3·19	7·26	17·04	33·64	50·00
40	0·86	4·42	10·54	28·44	46·18	62·64
50	1·80	9·52	20·01	39·83	58·23	—

FOREIGN INTELLIGENCE.

Gotha Mutual Life Assurance Bank.—Extract from the Report for 1855.

I.—Assurances.

1. Proposals:—

	Persons.	Amount.
Proposals made in the course of 1855	1,699	£352,328
Standing over from 1854	50	11,386
	1,749	£363,714

The accepted of these proposals were—

	Persons.	Amount.
Of persons who were not yet assured	1,156	£245,171
Of persons who were already assured	249	45,200
	1,405	290,371
Refused or reduced by the Society	271	56,371
Withdrawn, not completed or reduced by the parties . . .	24	6,300
Standing over for consideration at the end of the year . .	49	10,672
	1,749	£363,714

2. Amount of Assurances:—

	Persons.	Amount.
At the beginning of the year	18,858	4,270,658
New assurances during the year	1,156	290,371
	20,014	£4,561,029
Cancelled—	Persons.	Amount.
By death	471	£104,886
By surrender, running off, &c.	180	43,471
	651	148,357
In force at the end of the year	19,363	£4,412,672
The clear increase was therefore 505 persons, with £142,014.		

3. Classes of Assurances:—

Whole life—	Persons.	Sums Assured.	Yearly Premiums.
Payable at death, or on attaining the 90th year of age	18,929	£4,315,400	£150,179
Payable at death, or at any younger age than the 90th year	184	43,886	2,389
	19,113	4,359,286	152,568
Survivorships	49	11,029	349
For terms of years	201	42,357	863
	19,363	£4,412,672	£153,780
According to the sex of assured—			
Males		18,192	4,179,872
Females		1,171	232,800
		19,363	£4,412,672

According to the ages of the assured and the amount of assurances:—

AGE.	Amount of Assurances.									TOTAL.		
	£28½—£142½.	£157—£285.	£300—£428.	£443—£570.	£586—£714.	£728—£857.	£871—£1,000.	£1,014—£1,143.	£1,157—£1,286.			£1,300—£1,429.
Number of Persons.											Persons.	Sums Assured.
15—20	4	..	..	..	..	1	..	..	..	..	5	1,200
21—25	78	6	2	1	..	..	..	1	..	..	88	10,728
26—30	417	96	24	12	14	6	..	2	..	..	575	104,014
31—35	1092	318	106	50	48	24	..	4	1	24	1,667	356,800
36—40	1644	501	156	104	72	33	5	9	3	39	2,566	573,128
41—45	1817	618	200	101	89	39	7	16	..	36	2,923	653,557
46—50	1945	682	245	133	71	54	9	13	1	27	3,180	703,386
51—55	1803	716	205	142	94	55	11	22	1	38	3,087	729,100
56—60	1392	513	202	118	57	40	10	32	6	26	2,396	581,643
61—65	880	349	108	72	50	39	5	7	3	10	1,523	354,643
66—70	440	164	61	58	29	17	4	12	2	8	795	207,814
71—75	210	89	35	15	14	12	5	5	1	2	388	99,943
76—86	113	28	8	13	2	2	..	4	..	..	170	36,716
Total..	11,835 persons, £1,220,614.	4,080 persons, £1,005,285.	1,352 persons, £547,186.	819 persons, £456,371.	540 persons, £381,628.	322 persons, £274,571.	56 persons, £55,028.	127 persons, £144,272.	18 persons, £22,143.	214 persons, £305,574.	19,363	4,412,672

The average age of the assured was, at the beginning of the year, 48 years 6 months; and at the end of the year, 48 years 9 months. The average amount of the sum assured on each life was, at the beginning of the year, £226. 9s.; and at the end, £227. 17s.

Deaths:—

Age.	Assured in the course of 1855.	Should die, according to the Tables used.	Died.	Plus.	Minus.	Mortality per cent.
15—25	100	0·66	..	..	0·66	..
26—30	603	5·05	4	..	1·05	0·66
31—35	1,727	17 06	12	..	5·06	0·69
36—40	2,614	29·81	26	..	3·81	0·99
41—45	2,982	36·66	34	..	2·66	1·14
46—50	3,254	50·21	51	0·79	..	1·57
51—55	3,178	63·78	81	17·22	..	2·55
56—60	2,468	63·78	57	..	6·78	2·31
61—65	1,592	52·67	64	11·33	..	4 02
66—70	861	38·15	66	27·85	..	7·67
71—75	431	30·13	42	11·87	..	9·74
76—84	204	29·87	34	4·13	..	16·67
Total ..	20,014	417·83	471	73·19	20·02	

Of the 471 persons on whose life the total sum of £104,886 was assured, only 463 (for £102,314) were entitled to full payment. Five assured (for £1,643), who had died by suicide, left to their representatives no claim to the sum assured, but only to a return out of reserved fund. This return was, in one case of suicide which was "*non compos mentis*," the full value of the policy; in four cases of intentional suicide, the usual purchase price. Another assured person, who had shortened his life by intoxication, left only a similar claim. In another case the claim was forfeited because the assured died by a wound received in duel; and in the eighth case, because the assured had concealed an important disease with which he was afflicted.

The proportion of deaths was 426 males and 45 females. In the course of 1855, 18,784 males and 1,230 females being assured, the rate of mortality of the former was 2·27 per cent., of the latter 3·66 per cent.

An accurate table in the appendix of the report shows, in the case of every death, the age of the assured at the date of the assurance, the age at his death, and the cause of the death. There died 59 by phthisis, 51 by inflammation of the respiratory organs, 50 by nervous fever, 48 by apoplexy, 33 by dropsy, 33 by marasmus senilis, 23 by cholera Asiatica, 5 by suicide.

Dr.	II.—Cash Account for the Year 1855.	£.
Invested capital at the end of 1854		1,109,017
Amount of new premiums for 1855		9871
„ renewal premiums for 1855		145,279
„ premiums paid in advance		6
„ commuted premiums and extra premiums		1,045
Interest on loans		44,403
Dividends unclaimed		261
Profit from agio on money, existing bonds, bills of exchange, &c.		99
House rent, deducting all charges		85
Extra receipts for deposits, &c.		549
	Total	£1,310,615

<i>Cr.</i>		£.
	Paid 3 claims for the year 1853	400
	" 71 " " 1854	17,186
	" 365 " " 1855	77,286
	" 2 claims fallen due in lifetime	357
	Dividends to the assured for the year 1849	526
	Dividends to the assured for the year 1850	37,848
	For policies purchased	1,618
	Agents' commission	3,588
	Expenses of management	4,229
	Extraordinary expenses	1,558
	Invested capital at the end of 1855	1,166,019
	Total	£1,310,615

III.—*Balance-sheet for the Year 1855.*

<i>Dr.</i>		£.
	108 claims unsettled	28,386
	Unclaimed dividends for year 1850	586
	Deposits received in cash	4,218
	Reserve, or the value of all existing policies at the 31st Dec., 1855, without any regard to the premiums or parts of premiums paid since this date	864,659
	Gross amount of premiums in advance for the time after the 31st December, 1855 (<i>Prämienübertrag</i>)	74,143
	Surplus (guarantee fund)—	
	Surplus of 1851-54	£153,092
	Surplus of 1855	40,936
	Total	£1,166,020

<i>Cr.</i>		£.
	Cash in hand	10,373
	Mortgages	1,066,372
	Advances on policies	45,829
	Interest due	9,401
	Value of the Society's house	4,729
	Balances due by agents	11,798
	Balances at bankers'	17,518
	Total	£1,166,020

The guarantee fund comprises, according to the former balance-sheets—

		£.
	The residue of the surplus of 1851	24,267
	The surplus of 1852	43,022
	" 1853	38,895
	" 1854	46,908
	" 1855	40,936
	Total	£194,028

In the course of 1856 the surplus of 1851-52 is divided among the assured who have paid premiums in 1851. It consists of

		£.
	The residue of surplus of 1851	24,267
	Part of the surplus of 1852, corresponding to the premiums paid in 1851, which are due in 1852 (£64,383)	19,850
	Total	£44,117

The premiums for whole life assurances and survivorships paid in 1851

being £133,689, the surplus of £44,117 gives a dividend of 33 per cent. This dividend is made in the course of 1856, on all existing policies, by way of reduction of premiums; and on all policies cancelled by death or surrender, by payment in cash on bonds, which are issued at the extinction of the policies.

The investments on loans and mortgages are—

£.	
988,855	first mortgages on land, of at least double the value.
26,310	” ” house property, of at least double the value, and insured against fire.
24,569	in bonds of public Loan Societies, based on land securities.
12,773	in bonds of public corporations, whose management is under the control of the Government.
13,865	on mortgage of stocks.
£1,066,372	Total.

CORRESPONDENCE.

ON THE EQUATION OF ARBITRARY RATES OF LIFE PREMIUM.

To the Editor of the Assurance Magazine.

SIR,—I do not think that either Messrs. Wylie or Scott make fair allowance for the facility which is afforded for the adjustment of arbitrary life premiums by the computation of ordinary commutation tables.

Without adverting to the circumstance of Mr. Wylie having formerly addressed you on the subject, I have made frequent use of such tables for the calculation of assurances, where the duration of the terms of payment or of benefit was irregular, and can bear testimony to the facility afforded by the methods to which I briefly draw your attention.

Given a table of “whole life” premiums, to form therefrom a commutation table. Since $\pi_x = v - \frac{N_x}{N_{x-1}}$, then $N_x = (v - \pi_x)N_{x-1}$; i.e., with an arbitrary radix, for N, one year younger than the youngest age of the column to be formed, we at once get the logarithms of the succeeding values, by the successive addition of the logarithm of $v - \pi_x$ for each year of age. From this single column we can find all the *annuity* values by the usual formulæ, substituting for D_x , $N_{x-1} - N_x$.

Again: since $\pi_x = \frac{M_x}{N_{x-1}}$, then $M_x = \pi_x N_{x-1}$, by the computation of which we are furnished with the only remaining column necessary for the calculation of all assurance values.

Finally: should the computer be desirous of eliminating the mortality table producing the results thus found, it can be done with facility from the ordinary column D, $D_x = N_{x-1} - N_x$.

1. To exhibit the fraction measuring the probability of the life surviving one year, the form in which the table admits of the easiest comparison with others, we have (Gray's *Tables and Formule*, p. 119), $D_{x+1} = D_x p_x v$,